Notice/Disclaimer: The clinical information contained herein is provided for the express purpose of aiding the Pharmacy and Therapeutics ("P&T") Committee members in reviewing medications for inclusion in or exclusion from the Virginia Preferred Drug List. This information is not intended nor should it be used as a substitute for the expertise, skill, and judgment of physicians, pharmacists, or other healthcare professionals. The absence of a warning for any given drug or drug combination should not be construed to indicate that the drug or drug combination is safe, appropriate or effective for any given patient. This information is intended to supplement the knowledge and additional resources available to the P&T Committee members and should not be considered the sole criteria used by the P&T Committee in deciding what medications will be included or excluded from the Virginia Preferred Drug List.

PROTON PUMP INHIBITORS			
Characteristic	**Prilosec (omeprazole)**	**Aciphex (rabeprazole)**	**Protonix (pantoprazole)**
Pharmacology	Proton pump inhibitors (PPIs) are drugs that bind hydrogen/potassium adenosine triphosphatase (H+/K+ ATPase) in gastric parietal cells; inactivation of this enzyme system (also known as the proton, hydrogen or acid pump) blocks the final step in the secretion of hydrochloric acid and are the most potent gastric acid-suppressing agents in clinical use.		
Generic formulation available?	Yes (20mg strength available generically only)	No	No
Dosage forms / strengths / route of admin.	10mg, 20mg,40mg delayed release capsule for oral administration	20mg delayed release tablet for oral administration	• 20mg, 40mg delayed release tablet for oral administration • Powder containing 40 mg of pantoprazole per vial for injection
Dosing frequency	Once daily	Once daily	Once daily
Indications	• Duodenal ulcer (treatment) • Gastric ulcer (treatment) • Erosive Esophagitis (treatment & maint.) • Symptomatic GERD • Hypersecretory conditions • *H. pylori* treatment	• Duodenal ulcer (treatment) • GERD (treatment & maint.) • Hypersecretory conditions • Helicobacter pylori eradication to reduce risk of duodenal ulcer recurrence	• Erosive Esophagitis (treatment & maint.) • Hypersecretory conditions
Contraindications	Hypersensitivity to any component of the formulation of the product	Hypersensitivity to any component of the formulation of the product	Hypersensitivity to any component of the formulation of the product
Drug interactions	• Decrease absorption of drugs which are more readily absorbed in an acidic environment like digoxin and ketoconazole • Decrease clearance of drugs metabolized via the cytochrome P450 enzymes CYP3A4 and CYP2C19 like cyclosporine, disulfiram, diazepam, benzodiazepines, cyclosporine, phenytoin, and warfarin.	• Decrease absorption of drugs which are more readily absorbed in an acidic environment like digoxin and ketoconazole	• Decrease absorption of drugs which are more readily absorbed in an acidic environment like digoxin and ketoconazole

PROTON PUMP INHIBITORS			
Characteristic	**Prilosec (omeprazole)**	**Aciphex (rabeprazole)**	**Protonix (pantoprazole)**
Major AEs/ Warnings	• Headache • Diarrhea • Rash • Atrophic gastritis has been noted in gastric corpus biopsies from patients receiving long-term treatment. • Increase in carcinoid tumors was observed in rates after long-term PPI treatment. There results have not been reproduced in humans. • Symptomatic response to PPI therapy does not preclude gastric malignancy. • Pregnancy Category C. • Use with caution in nursing mother.	• Headache • Diarrhea • Rhinitis • Increase in carcinoid tumors was observed in rates after long-term PPI treatment. There results have not been reproduced in humans. • Symptomatic response to PPI therapy does not preclude gastric malignancy. • Pregnancy Category B • Use with caution in nursing mother.	• Headache • Diarrhea • Flatulence • Atrophic gastritis has been noted in gastric corpus biopsies from patients with H. pylori receiving long-term treatment only. • Increase in carcinoid tumors was observed in rates after long-term PPI treatment. There results have not been reproduced in humans. • Symptomatic response to PPI therapy does not preclude gastric malignancy. • Pregnancy Category B • Use with caution in nursing mother.
Pharmacokinetic issues	Give ½ hour before meals for best results	Give ½ hour before meals for best results	Give ½ hour before meals for best results
Dosage adjustment in key populations	Severe hepatic impairment in patients on long-term therapy may necessitate dosage reduction	Severe hepatic impairment in patients on long-term therapy may necessitate dosage reduction	None

PROTON PUMP INHIBITORS		
Characteristic	**Nexium (Esomeprazole)**	**Prevacid (lansoprazole)**
Pharmacology	Proton pump inhibitors (PPIs) are drugs that bind hydrogen/potassium adenosine triphosphatase (H+/K+ ATPase) in gastric parietal cells; inactivation of this enzyme system (also known as the proton, hydrogen or acid pump) blocks the final step in the secretion of hydrochloric acid and are the most potent gastric acid-suppressing agents in clinical use.	
Generic formulation available?	No	No
Dosage forms / strengths / route of admin.	20mg, 40mg delayed release capsule	15mg, 30mg delayed release capsule 15mg, 30mg suspension DR suspension packets
Dosing frequency	Once Daily	Once daily
Indications	• Erosive Esophagitis (treatment & maint.) • Symptomatic GERD • *H pylori* treatment	• Duodenal ulcer (treatment & maintenance) • Gastric ulcer (treatment) • Erosive Esophagitis (treatment & maint.) • Symptomatic GERD • Hypersecretory conditions • *H pylori* treatment • NSAID ulcers (treatment & maintenance)
Contraindications	Hypersensitivity to any component of the formulation of the product	Hypersensitivity to any component of the formulation of the product
Drug interactions	• Decrease absorption of drugs which are more readily absorbed in an acidic environment like digoxin and ketoconazole • Diazepam	• Decrease absorption of drugs which are more readily absorbed in an acidic environment like digoxin and ketoconazole • Theophylline
Major AEs/ Warnings	• Headache • Diarrhea • Abdominal pain • Atrophic gastritis has been noted in gastric corpus biopsies from patients receiving long-term treatment. • Increase in carcinoid tumors was observed in rates after long-term PPI treatment. There results have not been reproduced in humans. • Symptomatic response to PPI therapy does not preclude gastric malignancy. • Pregnancy Category B • Use with caution in nursing mother.	• Headache • Diarrhea (dose-related) • Dizziness • Nausea/Vomiting • Increase in carcinoid tumors was observed in rates after long-term PPI treatment. There results have not been reproduced in humans. • Symptomatic response to PPI therapy does not preclude gastric malignancy. • Pregnancy Category B • Use with caution in nursing mother.

PROTON PUMP INHIBITORS		
Characteristic	**Nexium (Esomeprazole)**	**Prevacid (lansoprazole)**
Pharmacokinetic issues	Give ½ hour before meals for best results`	Give ½ hour before meals for best results
Dosage adjustment in key populations	Severe hepatic impairment in patients on long-term therapy may necessitate dosage reduction.	Severe hepatic impairment in patients on long-term therapy may necessitate dosage reduction. Consider dose reduction in Asian patients.

H_2 RECEPTOR ANTAGONISTS				
Characteristic	**Tagamet (cimetidine)**	**Zantac (ranitidine)**	**Pepcid (famotidine)**	**Axid (nizatidine)**
Pharmacology	H2 antagonists competitively inhibit the action of histamine on the H2 receptors of the parietal cells, reducing gastric acid output under daytime and nocturnal basal conditions and also when stimulated by food, insulin, amino acids, histamine, or pentagastrin. Basal and nocturnal gastric acid secretion appears to be inhibited to a greater extent than are meal- and pentagastrin-stimulated gastric acid secretion. These agents are indicated for duodenal and gastric ulcer maintenance and treatment, GERD, pathological hypersecretory conditions, prevention of upper GI bleeding, prevention of aspiration pneumonitis and prevention of stress ulcers.			
Generic formulation available?	Yes	Yes (capsules and tablets only)	Yes (regular tablet only)	Yes
Dosage forms / route of admin.	200mg, 300mg, 400mg & 800mg tablet, 300mg/5ml oral solution, 6mg/ml, 300mg/2ml, 90mg/100ml, 120mg/100ml, 180mg/100ml, 240mg/100ml, 300mg/100ml, 480mg/ml inj	150mg & 300mg tablet & caps 150mg effervescent granule packet, (n/a generically) 15mg/ml syrup, (n/a generically) 1mg/ml & 25mg/ml injection	20mg, & 40mg tablet, 20mg & 40mg orally disintegrating tablet, 40mg/5ml suspension, (not available generically) 0.4mg/ml & 10mg/ml injectable	150mg & 300mg capsule
Dosing frequency	QD(once daily) to QID (four times daily)	Once or twice daily	Once or twice daily	Once or twice daily
Indications	▪ Duodenal ulcer (treat & maint) ▪ GERD (treat) ▪ Gastric ulcer (treat) ▪ Pathologic hypersecretory conditions ▪ GI bleed (prevent) ▪ Heartburn/indigestion/sour stomach (OTC only)	▪ Duodenal ulcer (treat & maint) ▪ GERD (treat& maint) ▪ Gastric ulcer (treat& maint) ▪ Pathologic hypersecretory conditions	▪ Duodenal ulcer (treat & maint) ▪ GERD (treat) ▪ Gastric ulcer (treat) ▪ Pathologic hypersecretory conditions ▪ Heartburn/indigestion/sour stomach (OTC only)	▪ Duodenal ulcer (treat & maint) ▪ GERD (treat) ▪ Gastric ulcer (treat)

H_2 RECEPTOR ANTAGONISTS				
Characteristic	**Tagamet (cimetidine)**	**Zantac (ranitidine)**	**Pepcid (famotidine)**	**Axid (nizatidine)**
Other studied uses	▪ Peptic ulcer therapy as part of a multi-drug regimen to eradicate H. pylori ▪ Aspiration pneumonitis (prevention) ▪ Stress ulcer prophylaxis ▪ Hirsute women ▪ Chronic idiopathic urticaria ▪ Anaphylaxis ▪ Warts	▪ GI bleeding (prevention) ▪ Peptic ulcer therapy as part of a multi-drug regimen to eradicate H. pylori (Helidac®) combination is FDA approved for *H pylori* ▪ Aspiration pneumonitis (prevention) ▪ Stress ulcer prophylaxis ▪ Gastric NSAID damage (prevention) ▪ Urticaria	▪ GI bleeding (prevention) ▪ Peptic ulcer therapy as part of a multi-drug regimen to eradicate H. pylori ▪ Aspiration pneumonitis (prevention) ▪ Stress ulcer prophylaxis ▪ Urticaria	▪ Peptic ulcer therapy as part of a multi-drug regimen to eradicate H. pylori
Contraindications	▪ Hypersensitivity to agent or any of its ingredients			
Drug interactions	Inhibition of metabolism of theophylline, warfarin and phenytoin	Usually not significant when used in standard doses		
Major AEs / Warnings	Constipation, diarrhea			
Pharmacokinetics issues	Most effective when given at bedtime			
Dosage adjustment in key populations	Decrease dose if creatinine clearance <50ml/min	Decrease dose if creatinine clearance <50ml/min	Decrease dose if Moderate (Ccr < 50 mL/min) or severe renal insufficiency (Ccr <10 mL/min) is present	Decrease dose if creatinine clearance <50ml/min

Non-Sedating Antihistamines			
Characteristic	**Allegra (fexofenadine)**	**Claritin (loratadine)**	**Zyrtec (cetirizine)**
Pharmacology	Antihistamines are reversible, competitive H_1 receptor antagonists that reduce or prevent most of the physiologic effects that histamine normally induces at the H_1receptor site. They do not prevent histamine release nor bind with histamine that has already been released. Antihistaminic effects include inhibition of respiratory, vascular, and GI smooth muscle constriction; decreased capillary permeability, which reduces the wheal, flare, and itch response;and decreased histamine-activated exocrine secretions (eg, salivary, lacrimal). Antihistamines with strong anticholinergic (atropine-like) properties also can potentiate the drying effect by suppressing cholinergically innervated exocrine glands. **First-generation antihistamines** bind nonselectively to central and peripheral H_1 receptors and can result in CNS stimulation or depression. CNS depression, which usually occurs with higher therapeutic doses, allows some of these agents to be used clinically for sedation. However, **second-generation antihistamines** are selective for peripheral H_1 receptors and, as a group, are less sedating. Several first-generation agents (eg, diphenhydramine, some piperazines, promethazine) with strong anticholinergic properties bind to central muscarinic receptors and produce antiemetic effects, decreasing nausea, vomiting, and motion sickness.		
Generic formulation available?	No	Yes OTC status	No
Approved by FDA	July 25, 1995.	April 12, 1993.	December 12, 1995.
Dosage forms / route of admin.	Tablets: 30mg, 60 mg, 180 mg Capsules: 60 mg	Tablets: 10 mg Reditabs (rapidly disintegrating tablet): 10mg Syrup: 1 mg/mL,	Tablets: 5 mg, 10 mg Syrup: 5 mg/5 mL.
Dosing frequency	BID or QD	QD	QD

Non-Sedating Antihistamines			
Characteristic	**Allegra (fexofenadine)**	**Claritin (loratadine)**	**Zyrtec (cetirizine)**
Dosing	**Seasonal allergic rhinitis:** Adults and children 12 years of age and older: 60 mg twice daily or 180mg once daily. Children 6 to 11 years of age: 30 mg twice daily. **Chronic idiopathic urticaria:** Adults and children 12 years of age and older: 60 mg twice daily. Children 6 to 11 years of age: 30 mg twice daily. **Renal function impairment:** Adults and children 12 years of age and older: 60 mg once daily as a starting dose. Children 6 to 11 years of age: 30 mg once daily as a starting dose.	**Adults and children 6 years of age and older:** 10 mg once daily. **Children 2 to 5 years of age:** 5 mg (5 mL) syrup once daily. **Hepatic/Renal function impairment (GFR less than 30mL/min):** Adults and children 6 years of age and older: 10mg every other day as starting dose. Children 2 to 5 years of age: 5 mg every other day as starting dose.	**Adults and Children 12 Years and Older:** The recommended initial dose is 5 or 10 mg per day in adults and children 12 years and older, depending on symptom severity. Most patients in clinical trials started at 10 mg. **Children 6 to 11 Years:** The recommended initial dose in children aged 6 to 11 years is 5 or 10 mg (1 or 2 teaspoons) once daily depending on symptom severity. **Children 2 to 5 Years:** The recommended initial dose in children aged 2 to 5 years is 2.5 mg (1/2 teaspoon) once daily. The dosage in this age group can be increased to a maximum dose of 5 mg per day given as 1 teaspoon (5 mg) once daily, or as 1/2 teaspoon (2.5 mg) given every 12 hours. **Children 6 months to <2 years:** The recommended dose in children 6 months to 23 months of age is 2.5 mg (1/2 teaspoon) once daily. The dose in children 12 to 23 months of age can be increased to a maximum dose of 5 mg per day, given as 1/2 teaspoonful (2.5 mg) every 12 hours. **Dose Adjustment for Renal and Hepatic Impairment** see below:
Indications	SAR, CIU	SAR, CIU	SAR, PAR, CIU
Other studied uses	Bee venom Immunotherapy, Pretreatment Solar Urticaria	None	Hyperemesis gravidarum
Contraindications	Known hypersensitivity	Known hypersensitivity	Known hypersensitivity
Drug interactions	Fexofenadine had no effect on the pharmacokinetics of erythromycin and ketoconazole. However, the AUC for fexofenadine increased 109% when given with erythromycin and 164% when given with ketoconazole	Loratadine AUC increased by erythromycin, ketoconazole, and cimetidine. Kinetics of above drugs is not affected. Package insert states there are no clinically relevant changes in the safety profile of loratadine when given with these drugs.	Coadministration of theophylline and cetirizine may cause decreased cetirizine clearance resulting in elevated cetirizine serum concentrations and possibly cetirizine toxicity. Until further studies of clinical impact are available, caution is warranted if cetirizine and theophylline are to be used
Major AEs / Warnings	▪ Drowsiness, headache, dizziness, fatigue, nausea, diarrhea, and dry mouth, nose and throat ▪ Pregnancy Category: C	▪ Drowsiness, headache, dizziness, fatigue, nausea, diarrhea, and dry mouth, nose and throat ▪ Pregnancy Category: B	▪ Drowsiness, headache, dizziness, fatigue, nausea, diarrhea, and dry mouth, nose and throat ▪ More drowsiness than fexofenadine or loratadine ▪ Pregnancy Category: B
Pharmacokinetics	None	None	None

Non-Sedating Antihistamines			
issues			
Dosage adjustment in key populations	Renal: A dose of 60 mg once daily is recommended as the starting dose in patients with decreased renal function.	Renal/Hepatic: Use a lower initial dose of loratadine (10 mg every other day) in patients with renal (GFR < 30 ml/min) or hepatic impairment.	Renal/Hepatic: In patients with decreased renal function (CrCl 11 to 31 ml/min), hemodialysis patients and in hepatically impaired patients, 5 mg once daily is recommended.

SAR = Seasonal Allergic Rhinitis, PAR = Perennial Allergic Rhinitis, CIU = Chronic Idiopathic Urticaria, VR = Vasomotor Rhinitis

Non-Sedating Antihistamines	
Characteristic	**Clarinex (desloratadine)**
Pharmacology	Antihistamines are reversible, competitive H_1 receptor antagonists that reduce or prevent most of the physiologic effects that histamine normally induces at the H_1receptor site. They do not prevent histamine release nor bind with histamine that has already been released. Antihistaminic effects include inhibition of respiratory, vascular, and GI smooth muscle constriction; decreased capillary permeability, which reduces the wheal, flare, and itch response;and decreased histamine-activated exocrine secretions (eg, salivary, lacrimal). Antihistamines with strong anticholinergic (atropine-like) properties also can potentiate the drying effect by suppressing cholinergically innervated exocrine glands. **First-generation antihistamines** bind nonselectively to central and peripheral H_1 receptors and can result in CNS stimulation or depression. CNS depression, which usually occurs with higher therapeutic doses, allows some of these agents to be used clinically for sedation. However, **second-generation antihistamines** are selective for peripheral H_1 receptors and, as a group, are less sedating. Several first-generation agents (eg, diphenhydramine, some piperazines, promethazine) with strong anticholinergic properties bind to central muscarinic receptors and produce antiemetic effects, decreasing nausea, vomiting, and motion sickness.
Generic formulation available?	No
Approved by FDA	December 21, 2001
Dosage forms / route of admin.	Tablets: 5 mg
Dosing frequency	QD
Dosing	Adults and children 12 years of age and older: The recommended dose is 5 mg once daily. In patients with liver or renal impairment, a starting dose of one 5 mg tablet every other day is recommended based on pharmacokinetic data.
Indications	SAR, PAR, CIU
Other studied uses	None
Contraindications	Known hypersensitivity
Drug interactions	No interactions per package insert.
Major AEs / Warnings	▪ Drowsiness, headache, dizziness, fatigue, nausea, diarrhea, and dry mouth, nose and throat ▪ Pregnancy Category: C
Pharmacokinetics issues	None Desloratadine is the active metabolite of loratadine
Dosage adjustment in key populations	Renal/Hepatic: Use a lower initial dose of desloratadine (5 mg every other day) in patients with renal (GFR < 30 ml/min) or hepatic impairment.

SAR = Seasonal Allergic Rhinitis, PAR = Perennial Allergic Rhinitis,
CIU = Chronic Idiopathic Urticaria, VR = Vasomotor Rhinitis

Non-Sedating Antihistamine Combinations			
Characteristic	**Claritin –D & Claritin-D 24H (loratadine/ pseudoephedrine)**	**Allegra – D (fexofenadine/pseudoephedrine)**	**Zyrtec-D (cetirizine/ pseudoephedrine)**
Generic formulation available?	No	No	No
Dosage forms / route of admin.	Claritin-D 12H—120mg pseudoephedrine sulfate (SR) / 5mg loratadine (IR) Claritin-D 24H—240mg pseudoephedrine sulfate (SR)/ 10mg loratadine (IR)	Extended-Release Tablet 120mg pseudoephedrine HCl (ER)/ 60mg fexofenadine (IR)	120 mg pseudoephedrine HCl (ER) 5 mg tablet
Dosing frequency	12H; 24H	BID	BID
Indications	Relief of symptoms of seasonal allergic rhinitis in those ≥ 12 years.		Relief of nasal and non-nasal symptoms associated with seasonal or perennial allergic rhinitis in those ≥ 12 years.
Other studied uses	None are reported		
Contraindications	Hypersensitivity; Narrow angle glaucoma; Urinary retention; MAO Inhibitors within 14 days of stopping such treatment; Severe hypertension; Severe coronary artery disease		
Drug interactions	• MAO Inhibitors ▪ Antihypertensive drugs which interfere with sympathetic activity	▪ MAO Inhibitors ▪ Antihypertensive drugs which interfere with sympathetic activity. ▪ Ketoconazole or erythromycin enhances fexofenadine absorption.	▪ MAO Inhibitors ▪ No interactions were observed when cetirizine was given with pseudoephedrine, antipyrine, ketoconazole, erythromycin, or azithromycin. ▪ Theophylline given with cetirizine caused a 16% decrease in the clearance of cetirizine. Theophylline was not altered.
Major AEs / Warnings	▪ Hypertension; Diabetes Mellitus; Ischemic heart disease; Increased intraocular pressure; Hyperthyroidism; Renal Impairment; Prostatic hypertrophy; ▪ Sympathetic amines may produce CNS stimulation with convulsions or CV collapse with accompanying hypotension.		
Pharmacokinetics issues	▪ Mean elimination T1/2: Loratadine – 8.4h; Descarboethyoxyloratadine (active metabolite) –28h ▪ Predominantly metabolized by P450 CYP3A4, and to a lesser extent by CYP2D6	▪ Mean elimination T1/2: Fexofenadine – 14.4h; Pseudoephedrine – 4-6 h & pH dependent ▪ Coadministration with food should be avoided – a high fat meal decreased Cmax (-46%) and AUC (-42%) and Tmax was delayed by 50%	▪ Mean elimination T1/2: Cetirizine – 7.9h; Pseudoephedrine – 6.0h ▪ May be taken with or without food. ▪ Elimination: 70% in urine; 10% in feces. ▪ The enzymes responsible for metabolism of cetirizine have not been identified.
Dosage adjustment in key populations	Renal & Hepatic Impairment	Renal impairment	Renal & Hepatic Impairment

INTRANASAL STEROIDS				
Characteristic	**Beconase AQ (beclomethasone)**	**Rhinocort (budesonide)**	**Nasalide (flunisolide)**	**Nasarel (flunisolide)**
Pharmacology	These drugs have potent glucocorticoid and weak mineralocorticoid activity. The mechanisms responsible for the anti-inflammatory action of corticosteroids on the nasal mucosa are unknown. However, glucocorticoids have a wide range of inhibitory activities against multiple cell types (eg, mast cells, eosinophils, neutrophils, macrophages, lymphocytes) and mediators (eg, histamine, eicosanoids, leukotrienes, cytokines)involved in allergic and nonallergic/irritant-mediated inflammation. These agents, when administered topically in recommended doses, exert direct local anti-inflammatory effects with minimal systemic effects. Exceeding the recommended dose may result in systemic effects, including hypothalamic-pituitary-adrenal(HPA) function suppression.			
Generic available?	No	No	Yes	No
Dosage forms / route of admin	▪ Beconase AQ	Rhinocort ▪ 32 mcg/spray (Rhinocort nasal inhaler has been discontinued as of November 15, 2002) Rhinocort Aqua ▪ 32 mcg/spray	Nasalide ▪ 25 mcg/spray (AQ product) Flunisolide • 25 mcg/spray (AQ product)	Nasarel ▪ 25 mcg/spray (AQ product)
Date Approved by FDA	July 27, 1987	Feb 21, 1994	Approved prior to Jan 1, 1982	March 08, 1995
Dosing frequency	**Adults and children 12 years of age:** Usual dosage is 1 or 2 inhalations (42mcg to 84mcg in each nostril twice a day (168 to 336 mcg/day). **Children 6 to 12 years of age:** Start with 1 inhalation in each nostril twice daily;patients not adequately responding to 168mcg or those with more severe symptoms may use 336 mcg (2 inhalations in each nostril). **Not recommended for children < 6 years of age**	**Adults and children 6 years of age and older:** Recommended starting dose is 64 mcg/day administered as 1 spray/nostril once daily. Some patients who do not achieve symptom control at the recommended starting dose may benefit from an increased dose. It is always desirable to titrate an individual patient to the minimum effective dose to reduce the possibility of side effects. **Maximum recommended doses:** **Adults 12 years of age and older:** 256 mcg/day administered as 4sprays/nostril once daily. **Children 6 through 11 years of age:** 128 mcg/day administered as 2sprays/nostril once daily.	**Adults:** Starting dose is 2 sprays (50 mcg) in each nostril 2 times a day (total dose 200mcg/day). May increase to 2 sprays in each nostril 3 times a day (total dose 300mcg/day). Maximum daily dose is 8 sprays in each nostril (400 mcg/day). **Children 6 to 14 years of age:** Starting dose is 1 spray (25 mcg) in each nostril 3 times a day or 2 sprays (50 mcg) in each nostril 2 times a day (total dose 150 to 200 mcg/day). Maximum daily dose is 4 sprays in each nostril (200 mcg/day). Improvement in symptoms usually becomes apparent within a few days. However, relief may not occur in some patients for as long as 2 weeks. Do not use > 3 weeks in absence of significant symptomatic improvement. **Flunisolide is not recommended for use in children < 6 years of age**	
Indications	▪ SAR, PAR ▪ Prevention of recurrence of nasal polyps following surgical removal. ▪ For spray only: non-allergic (vasomotor rhinitis)	▪ SAR, PAR ▪ Non-allergic perennial rhinitis in adults only (Rhinocort Nasal Inhaler only)	▪ SAR, PAR	▪ SAR, PAR
Contraindications	Untreated local infections, hypersensitivity			
Other studied uses	Rhinosinusitis, Adjunctive treatment			

INTRANASAL STEROIDS				
Characteristic	**Beconase AQ (beclomethasone)**	**Rhinocort (budesonide)**	**Nasalide (flunisolide)**	**Nasarel (flunisolide)**
Pregnancy Category	C	C	C	C
Drug interactions	None	None	None	None
Major Aes / Warnings	• Local burning or stinging, throat irritation, bad taste, sneezing, itching, epistaxis Watch for systemic effects.			
Pharmacokinetics issues: Bioavailability	≈20% (Theoretical estimate from inhaled beclomethasone)	≈10%, oral	50% (Nasarel and Nasalide are not bioequivalent. Total absorption for Nasarel was 25% less than Nasalide.)	
Dosage adjustment in key populations	None	None	None	None

INTRANASAL STEROIDS			
Characteristic	**Flonase (fluticasone)**	**Nasonex (mometasone)**	**Nasacort, (triamcinolone)**
Pharmacology	These drugs have potent glucocorticoid and weak mineralocorticoid activity. The mechanisms responsible for the anti-inflammatory action of corticosteroids on the nasal mucosa are unknown. However, glucocorticoids have a wide range of inhibitory activities against multiple cell types (eg, mast cells, eosinophils, neutrophils, macrophages, lymphocytes) and mediators (eg, histamine, eicosanoids, leukotrienes, cytokines)involved in allergic and nonallergic/irritant-mediated inflammation. These agents, when administered topically in recommended doses, exert direct local anti-inflammatory effects with minimal systemic effects. Exceeding the recommended dose may result in systemic effects, including hypothalamic-pituitary-adrenal(HPA) function suppression.		
Generic available?	No	No	No
Dosage forms / route of admin.	Flonase ▪ 50 mcg/spray (AQ product)	Nasonex ▪ 50 mcg/ spray (AQ product)	Nasacort AQ ▪ 55 mcg/spray
Date Approved by FDA	October 19, 1994.	October 1, 1997	May 20, 1996
Dosing frequency	**Adults:** Recommended starting dose is 2 sprays (50 mcg each) per nostril once daily (total daily dose, 200 mcg). The same dosage divided into 100 mcg given twice daily (eg, 8 am and 8 pm) is also effective. Maximum total daily dosage should not exceed 200 mcg/day (2 sprays per nostril). **Adolescents and children 4 years of age and older:** Start with 100 mcg (1spray per nostril once a day). Patients not adequately responding to 100 mcg may use 200 mcg (2 sprays per nostril). Total daily dosage should not exceed 200 mcg/day.	**Adults and children 12 years of age and older:** The recommended dose is 2 sprays (50 mcg/spray) in each nostril once daily (total daily dose, 200 mcg). In patients with a known seasonal allergen that precipitates nasal symptoms of seasonal allergic rhinitis, prophylaxis with mometasone (200 mcg/day) is recommended 2 to 4 weeks prior to the anticipated start of the pollen season. **Children 2 to 11 years of age:** The recommended dose is 1 spray (50 mcg) in each nostril once daily(total daily dose, 100 mcg).	**Adults and children 12 years of age and older:** The recommended starting and maximum dose is 220mcg/day as 2 sprays in each nostril once daily. When the maximum benefit has been achieved and symptoms have been controlled in patients initially controlled at 220 mcg/day, decreasing the dose to 110mcg/day (1spray in each nostril per day) has been demonstrated to be effective in maintaining control of allergic rhinitis symptoms. **Children 6 through 11 years of age:** Nasacort AQ: The recommended starting dose is 110 mcg/day given as 1 spray in each nostril once daily. The maximum recommended dose is 220 mcg/day as 2 sprays per nostril once daily. Once symptoms are controlled, pediatric patients may be maintained on 110 mcg/day (1spray in each nostril per day). **Not recommended for children less than 6 years of age.**
Indications	▪ SAR, PAR ▪ Non-allergic perennial rhinitis	▪ SAR, PAR	▪ SAR, PAR
Contraindications	Untreated local infections, hypersensitivity		
Pregnancy Category	C	C	C
Other studied uses	Rhinosinusitis, Adjunctive treatment		
Drug interactions	± ketoconazole	None	None
Pharmacokinetics issues:Bioavailability	<2%, absolute	0.1%	25% (Data from oral inhalation)
Major AE/ Warnings	None	None	None

SAR= Seasonal Allergic Rhinitis; PAR= Perennial Allergic Rhinitis